T-117 Residential Yards, Removal Action Implementation Costs
October 1, 2012 - April 30, 2013

Department	Amount ($)
Removal Action Construction	1,039,100.00
Consultant Construction Oversight/Quality Assurance	245,600.00
City Oversight	127,000.00
Community Relations	59,500.00
EPA/USACE Oversight	143,800.00
Grand Total	**1,615,000.00**

List of Tables

Table 1-1	Management Roles and Responsibilities – Sediment and Upland Areas
Table 1-2	Activities Requiring Coordination between the Port and City
Table 1-3	Statement of Work Required Deliverables
Table 2-1	Removal Action Levels – T-117 Sediment and Upland Areas
Table 2-2	Applicable or Relevant and Appropriate Requirements or Other Requirements to be Considered – Performance
Table 2-3	Other Requirements to be Considered - Treatment and Disposal
Table 2-4	Other Requirements to be Considered
Table 3-1	T-117 Sediment Area Physical Properties
Table 3-2	Estimated Flows of Observed Groundwater Seeps
Table 3-3	Summary of Endangered Species Act Species and Critical Habitats
Table 4-1	Summary of Upland Area Design Report and RAWP Design Elements
Table 4-2	General Characteristics of South, Middle, and North Banks
Table 4-3	Bank Removal Volumes
Table 4-4	Summary of Predicted Low Tides for Summer 2013
Table 4-5	Management of Surface and Subsurface Debris
Table 4-6	Comparison of Possible Haul Routes
Table 4-7	Comparison of Groundwater Data Collected Upgradient of Dewatering Areas to Water Quality Criteria
Table 4-8	Water Discharge Criteria
Table 5-1	Summary of Sediment Area Design Report and RAWP Design Elements
Table 8-1	Engineer's Construction Cost Estimate Summary

6.2.1 Upland Area 6-3
6.2.2 Stockpile and Truck Loading Areas 6-4
6.3 Short-term Water Quality Impacts 6-4
6.3.1 In-water Activities 6-5
6.3.2 Stormwater 6-6
6.3.3 Soil Leachate 6-6

7 Permitting and Site Access 7-1
7.1 Compliance with ARARs and TBCs 7-1
7.2 Access and Easement Agreements 7-2
7.2.1 South Park Marina Property 7-2
7.2.2 Boeing Property 7-3
7.2.3 City Stormwater Overflow 7-3
7.3 Other Agreements 7-3
7.4 Traffic Management 7-3

8 Construction Sequence, Scheduling, and Cost Estimate 8-1
8.1 Organization of Cleanup Removals 8-1
8.2 Removal Action Sequence 8-1
8.3 Construction Schedule Milestones 8-2
8.4 Cost Estimate 8-3

9 Long-Term Environmental Monitoring 9-1
9.1 Removal Action Objective Monitoring 9-1
9.2 Recontamination Sources 9-2
9.2.1 Upland Area Soil 9-2
9.2.2 Upland Area Catch Basin Solids 9-2
9.2.3 Upland Area Building Materials and Asphalt Sealant 9-3
9.2.4 Upland Area Groundwater 9-3
9.2.5 T-117 Streets and Yards (Phase 2) 9-4
9.2.6 Offsite Upland Sources 9-4
9.3 Long-Term Monitoring and Maintenance Plan 9-6

10 Environmental Sustainability 10-1
10.1 General Construction Considerations 10-2
10.1.1 Upland Area Considerations 10-3
10.1.2 Sediment Area Considerations 10-3
10.1.3 Contractor Submittals 10-4

11 References 11-1

- **Contract Execution.** Upon full execution of the construction contract, the Contractor will order materials and develop critical contract submittals, but will not mobilize to the site until critical submittals have been approved by the Port (and regulatory agencies as required). Critical submittals may include:
  - **Project Schedule**. Detailed construction schedule identifying the sequence and durations of critical construction activities
  - **Port Administrative Submittals**. As required by the Port
  - **Contractor Remedial Action Work Plan.** The RAWP shall include, at a minimum, the following elements:
    - Project Approach
    - Baseline Schedule
    - Site-specific Construction Health and Safety Plan
    - Traffic Control Plan
    - Pollution Prevention Plan
    - Contractor's Erosion and Sedimentation Control Plan
    - Green and Sustainable Remediation Plan
    - Contractor's Quality Control Plan
    - Transportation and Disposal Plan
    - Surveying Plan
    - Excavation Support System Plan
    - Construction Water Management Plan
    - Settlement Monitoring Plan
    - Dewatering Plan
    - Earthwork Plan
    - Soil Stockpile Plan
    - Dredging Plan
    - Demolition Plan
    - Deconstruction Plan
    - Vessel Management Plan
    - Sheet Pile Driving Plan
    - Final Water Quality Monitoring Plan
    - Construction Checklist.
- **Notice-to-Proceed.** Upon EPA approval of the critical submittals, the Contractor may proceed with onsite construction activities.
- **Construction Activities and Sequence.** See Section 8.2.
- **Removal Action Construction Report.** Contractor's work is complete once the Port and EPA approve the construction report.

8.4 Cost Estimate

The total estimated project cost provided to EPA includes direct removal action construction contract costs and indirect costs. Cost estimates are based on recent experience at similar sites, engineering cost guidance, and best professional judgment.

upland equipment beginning in mid-June 2013, prior to the in-water work window, to allow upland excavation to occur during summer.

- **Riverbank Removal.** Excavation of bank areas below +14 ft MLLW and extending down to +2 ft MLLW in the intertidal area using upland excavation equipment. Following removal of vegetation, excavation will occur during day time low-tide periods from mid-June to September 2013, prior to the in-water work window.
- **Upland Excavation**. Soil removal using upland excavation equipment beginning any time after mobilization of equipment and implementation of water controls. Excavation during summer months is recommended to limit work during rainy conditions. Excavation procedures will ensure segregation of TSCA and non-TSCA material and appropriate management of debris. Upland excavation material will be loaded onto trucks and taken to a disposal site or an offsite transload facility. Wet material will be dewatered before loading onto trucks. The sequencing of surface paving removal and soil excavation will be determined by the Contractor and documented in the RAWP.
- **Removal of In-Water Debris.** Removal of the debris deflector, piles, and debris necessary for the completion of dredging and clean fill placement.
- **Potential Relocation of Floating Docks at the South Park Marina.** Temporary relocation of floating docks to allow for adequate marina vessel navigation operations during dredging and sheet pile installation.
- **In-Water Excavation.** Sediment dredging by water-based equipment after debris and bank removal. All sediment to be dredged is non-TSCA and will be loaded onto barges for transport to a transload facility, where it will be off-loaded onto trucks or rail cars for transport to a Subtitle D disposal site. Work will be restricted to the in-water work window, and dredging will not begin until after December 1, 2013 to minimize overlap with Tribal fishing activities.
- **Site Grading and Pile Installation**. Upland site grading and upland and sediment backfilling to final elevations. Bank completion cannot occur until after dredging is completed. Install 4 piles to support new debris deflector. Relocate Marina floats to desired location and install with up to 10 piles.
- **Site Inspection.** Pre-final and final site inspections/meetings among the Contractor, the Port, and EPA to determine whether all required construction activities have been completed to the Port's and EPA's satisfaction. Any needed follow-up work will be documented following the pre-final inspection, and satisfactory completion of that work will be determined during the final inspection.
- **Demobilization.** Removal of Contractor equipment, materials, and support structures.

8.3 Construction Schedule Milestones

Figure 8-1 presents the anticipated timeline from bidding through construction completion. The following are the anticipated RAWP and construction milestones:

- **Contract Award.** Port approval of Contractor proposal and request for Contractor to enter into contract

Table 8-1 presents the Contractor Bid Form (Specification Section 00410) items as the Engineer's estimate of the number of units of each item required to complete the work (for those that are not to be bid as a lump sum).

Table 8-1 Engineer's Construction Cost Estimate Summary (100% Submittal)

The Engineer's Estimate, which includes cost details, has been submitted as a separate deliverable to EPA.

Bid Item	Description	Quantity	Unit	Unit Cost ($)	Cost ($)
	DIRECT CAPITAL COSTS				
1	Mobilization and Demobilization	1	LS	---	---
2	Traffic Control (includes Traffic Signs)	1	LS	---	---
3	Construction Water Management System-Force Account	1	Force Account	---	---
4	Removal Action Work Plan	1	LS	---	---
5	Site Demolition	1	LS	---	---
6	Deconstruction	1	LS	---	---
7	Concrete Debris Handling and Recycling	5,100	TON	---	---
8	Asphalt Debris Handling and Recycling	3,500	TON	---	---
9	Construction Water Management System: first 1,000,000 Gallons of Water	1	LS	---	---
10	Upland and Riverbank Subtitle "D" Waste: Excavation, Stockpiling, Loading and Disposal	1	LS	---	---
11	Upland and Riverbank Additional Subtitle "D" Waste: Excavation, Stockpiling, Loading, Disposal, and Backfill with Compaction	3,600	CY	---	---
12	Upland and Riverbank Subtitle "C" Waste: Excavation, Stockpiling, Loading, and Disposal	1	LS	---	---
13	Contractor Designed Shoring - Design Furnish, Install, Decontaminate, and Remove from Site	1	LS	---	---
14	Shoreline Sheet Pilling - Design Furnish, Install, Decontaminate, and Remove from Site	1	LS	---	---
15	Offshore Subtitle "D" Waste: Dredging	1	LS	---	---
16	Offshore Subtitle "D" Waste: Transport, Transloading, and Disposal	21,600	TON	---	---
17	Additional (Cleanup Pass) Offshore Subtitle "D" Waste: Dredging	5,400	CY	---	---
18	Upland Backfill Re-Grade: Furnish and Place Including Compaction	1	LS	---	---
19	Riverbank Armor/Riprap: Furnish and Place	4,500	TON	---	---
20	Sediment Backfill: Furnish and Place	7,900	TON	---	---
21	Surveying - Upland	1	LS	---	---
22	Surveying - Offshore	1	LS	---	---
23	Utilities Bypass/Relocation	1	LS	---	---
24	Marina Isolated Soil Removal	4	4-Hour Duration	---	---
25	Marina Soil Disposal	70	TON	---	---
26	Marina Rip-Rap Restoration	70	TON	---	---
27	In-Water Structures	1	LS	---	---
	TOTAL ENGINEER'S ESTIMATE FOR BIDDING				---

Indirect Cost Items (not for bidding)	Estimated Cost ($)
Engineering Design Support (See Note 1)	---
Land Acquisition and ICs (See Note 2)	---
RA Construction Costs	---
Owner Surveys (as a contingent action)	---
CQA (6% of Construction Costs+Contingency, See Note 3)	---
Project Management	---
Construction Management (RE, Inspector, and support management staff)	---
Design Construction Support (2% of RA Construction Costs +Contingency)	---
Washington State Sales Tax (9.5% of RA Construction Costs+Contingency)	---
Contingency (10% of RA Construction Costs)	---
Long-Term Monitoring & Maintenance	---
H&S Measures (4% of RA Construction Costs+Contingency)	---
Agency Oversight (10% of RA Construction Costs+Contingency)	---
TOTAL ENGINEER'S ESTIMATE (DIRECT AND INDIRECT COSTS)	---

Notes:

1. Costs associated with post-EE/CA through Final Design.
2. Estimated cost of land acquisition and implementation of haul routes
3. Includes RAWP support, construction oversight including engineering, sampling, and analysis, and preparation of Removal Action Completion Report and LTMMP
4. Long-term monitoring includes the elements identified in the LTMMP which includes installation of new wells, sampling, analysis, and reporting.
5. CY = cubic yard; IC = institutional control; LS = lump sum; LTMMP = long-term maintenance and monitoring plan; RA = removal action.